



The surgical hospitalist:

A new solution for emergency surgical care?

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We introduced the University of California–San Francisco (UCSF) surgical hospitalist program in July 2005 with the primary intent of improving patient access to high-quality and timely hospital-based emergency surgical care. Since its inception, the surgical hospitalist program has sought to propose new solutions to the national challenges of inadequate surgical coverage for a growing patient population. We now describe this new innovation in access to emergency general surgery that redefines and strengthens the commitment to delivering safe and optimal patient-centered care while fulfilling the traditional academic mission to educate medical students and residents.

Emergency care system in crisis

The care of hospitalized patients has evolved rapidly over the last decade, as shifts in surgical and medical care to outpatient settings and

the pressure to reduce costs have increased the disease acuity of hospitalized patients as well as the need for improved clinical efficiency and care quality. The unscheduled nature of emergency care challenges health care providers and medical centers relentlessly and underscores the need to enhance organizational methods to improve perioperative patient safety. Between 1993 and 2003, demand for emergency care increased rapidly as emergency department (ED) visits grew nationally by 26 percent.¹ However, over the same period, the number of EDs across the nation declined by 425, and the number of hospital beds declined by 198,000. Ambulances are frequently diverted from overcrowded emergency rooms to other hospitals that may be farther away and may have inferior services. In 2003, ambulances were diverted 501,000 times, an average of once every minute.² Overcrowding is another challenge, forcing hospitals to “board” patients for 48 hours or more until a hospital bed becomes available. Increasing patient volume in an era of declining



UCSF MEDICAL CENTER AND SCHOOL OF MEDICINE

Aerial view of the University of California–San Francisco Medical Center.

resources has challenged the timely delivery of hospital-based ED care nationally.

Crisis in surgical care and call coverage

Concurrent with the challenges to the emergency care system, the availability of timely, high-quality, and cost-effective acute surgical care in the U.S. is adversely affected by a mismatch in supply and demand. The availability of key on-call specialists willing to take emergency call (especially neurosurgeons, orthopaedic surgeons, and general surgeons) is threatened by the rising costs of uncompensated care, escalating malpractice premiums, decreasing reimbursement, and lifestyle considerations. A staggering three-quarters of hospitals report difficulty finding specialists to take emergency and trauma calls.³

In July 2006, the Institute of Medicine pronounced in its report, *Hospital-Based Emergency*

Care: At the Breaking Point, that, “Emergency medical care in the United States is on the verge of collapse,” citing dangerous overcrowding and an inability to treat patients in a safe, timely, and efficient manner as the main reasons for this dire outlook.⁴ Hospitals in several states across America have closed their EDs because of inadequate surgical coverage, a trend with devastating consequences for critically injured or uninsured patients. In 2006, the American College of Surgeons concluded that, “the single most important factor shaping the surgical workforce issue today is declining reimbursement.”⁵

ACS statement on access to emergency care

In response to these challenges, the American College of Surgeons’ Advisory Council for General Surgery issued a Statement on Emergency Surgical Care approved by the Board of Regents



MAJED PHOTOGRAPHIC ILLUSTRATION

Examining Mr. Yao, a patient in the emergency department (left to right): Third-year UCSF medical student Seunggu Han; surgical hospitalist Dr. Maa; and emergency department physician Steve Polevoi, MD. The patient's daughter observes at right.

at its February 2007 meeting (see http://www.facs.org/fellows_info/statements/st-56.html for the complete statement). A central recommendation defined “the responsibility of all surgeons, regardless of their practice, to participate in their local system of emergency surgical care in order to provide for the health of the public.”⁶ The intent is for general surgeons to develop the proper training, knowledge, and skills to provide optimal treatment for surgical emergencies and coordinate appropriate medical and surgical specialists in the delivery of care that is “patient centered, humane, responsive, and readily accessible to all.”⁶

General surgery at academic medical centers

General surgical departments at academic medical centers nationally are confronted by new obstacles to the three traditional academic missions of education, scientific research, and

the provision of high-quality care. The growing popularity of specialization has added to the problem by fragmenting the practice of general surgery.⁷ The care of emergency surgical patients is time-intensive and associated with prolonged lengths of stay, and it often requires that specialized procedures be performed in the middle of the night or on weekends. Because teaching hospitals have historically been dependent on house staff, the Accreditation Council for Graduate Medical Education (ACGME) workweek restrictions have further challenged the delivery of acute surgical consultation services. Given the critical shortage of surgeons available and willing to take call and provide emergency and trauma consultation, it is clear that new models are necessary to address growing public demand and preserve the availability of timely, high-quality, and cost-effective patient care.

Before July 2005, emergency general surgical

UCSF Surgery Hospitalist mission statement

The mission of the UCSF Surgery Hospitalist program is to provide high-quality, timely, and efficient care to patients with emergency surgical conditions at UCSF Medical Center while also educating medical students and residents.

Vision:

- To promote evidence-based guidelines for the safe, timely, and comprehensive care of patients with emergency surgery diagnoses
- To provide appropriate medical student and resident teaching and supervision
- To provide the platform for surgical quality improvement research focusing on patient safety and high-quality surgical outcomes, particularly in perioperative processes of care
- To improve communication and professionalism between inpatient services in the coordination of inpatient patient care
- To propose a new solution to the crisis in access to emergency department care and alleviate the crisis of emergency department crowding, boarding, and ambulance diversion
- To enhance the utilization of emergency department, operating room, and medical center resources

care at UCSF was provided by a diverse faculty spread across two campuses, each surgeon taking call on a 24-hour basis. This system of care was problematic for several reasons. First, daytime consultations disrupted the elective procedures and clinics of on-call surgeons. Patients in the ED or acute care ward might wait hours until the on-call surgeon was available to evaluate them. Second, the diversity of surgical conditions left many surgeons uncomfortable caring for diseases outside their areas of expertise, especially when these conditions presented emergently. Third, the 24-hour structure of the call schedule and separate campuses disrupted continuity of care, particularly for those patients who would need subsequent care but were being treated by a surgeon based at a different hospital. Fourth, surgical house staff provided the

only continuity and were further constrained by the 80-hour ACGME workweek. Finally, there was little economic incentive for taking call; the only financial benefit by the surgeon or the department was revenue generated from the minority of consultations that resulted in a surgical procedure.

The solution: Principles and aims of a surgical hospitalist program

The medical hospitalist model, which was pioneered and instituted at UCSF in the 1990s, was introduced in response to the managed care movement and resulted in improved quality, reduced length of stay, and improved patient safety.⁸ This model has gained widespread acceptance, with nearly 20,000 hospitalists now working nationwide. By focusing on continuity and comprehensiveness of care, medical hospitalists have made substantial progress in both quality and efficiency improvement efforts for inpatients.⁹ The UCSF surgical hospitalist program was modeled after the medical hospitalist system and the following key principles: (1) dedicated availability of surgeons, (2) extended periods on service, (3) team-based practice, and (4) a platform for research and quality improvement. In 2005, we restructured the delivery of general surgery consultations at UCSF into a surgical hospitalist model with an emphasis on the continuous availability of surgical faculty to improve continuity and timeliness of hospital-based emergency surgical care, promote patient safety, and enhance education (see box, this page).

Three board-certified general surgeons staffed the service on a rotating weekly basis, dedicating 100 percent of their time to ED and inpatient consults. These surgeons had minimal elective procedures or clinics scheduled during their on-call service weeks. Surgical hospitalist attendings rounded daily, providing continuity of care and supervision of house staff. A goal of timely surgical consultation was implemented as a primary measure of performance. In addition to the direct clinical care, hospitalists also managed the majority of surgical transfer requests from referring hospitals throughout Northern California. For those patients possibly requiring

complex surgical intervention, the surgical hospitalist would consult an appropriate surgical specialist for further care after the patient had been stabilized and initially admitted. The key elements of the surgical hospitalist model are listed in Figure 1 (this page).

The program expanded in 2007 and now has seven faculty members. Since the program's inception, we have tracked several outcomes and measures of care: patient demographics and diagnoses, operative volume, time to consultation, and revenue generation. A first-year program report was published in the November *Journal of the American College of Surgeons*.¹⁰

Preliminary findings

Patient and disease characteristics. Three surgical hospitalists cared for 853 patients in the initial year, averaging 2.3 new consults per day. Patients averaged 53 years of age (range 17 to 100 years) and were racially diverse. Most presented with acute abdominal pain (63%), soft tissue infections (18%), malignancy (6%), or hernia (4%). Most consultations originated from the ED (57%), although general medicine (20%) and medical specialists (7%), including critical care physicians, accounted for significant numbers of consultations. Other surgeons were responsible for 8 percent of the total consult volume; these were generally surgical specialists such as neurosurgeons or urologists. Because our center

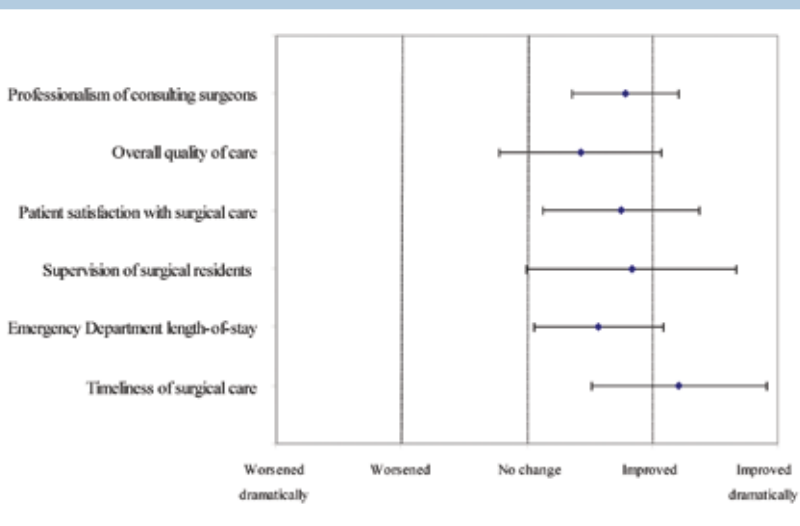
Figure 1

Key elements of the surgical hospitalist model

- On-call period lasts continuously for one week, not 24 hours, in order to improve continuity of care. During the on-call period, elective clinics or procedures, which might disrupt or conflict with acute surgical care, are minimized.
 - A resident or attending should evaluate the patient within 30 minutes of consultation during business hours and within 45 minutes during off-hours.
 - If the resident is unavailable, then the on-call attending will be contacted directly to see the patient independently.
 - Patients requiring special expertise are initially assessed by the team and then reassigned (triaged) to a higher level of expert care as indicated.
 - After the on-call period, the care of inpatients and consults are handed off to the next on-call surgeon in a group-practice model.
 - Patient safety is enhanced through increased resident supervision and improved signouts.
 - Revenue stems primarily from a per-diem payment from the hospital, procedural fees, and attending documentation of non-operative care.

Figure 2

Survey of emergency department providers after six months of UCSF surgical hospitalist care



is a level 2 trauma center, whereby most trauma cases are regionalized to San Francisco General Hospital, trauma accounted for only 3 percent of consultations. Transfers of patients from other institutions accounted for 6 percent.

Operative volume and triage to subspecialists. Among consults (n=359), 42 percent resulted in an operation, most commonly appendectomy (29%), incision and drainage of abscess (19%), exploratory laparotomy for intestinal resection or lysis of adhesions (19%), cholecystectomy (11%), and complex liver/spleen/pancreas procedures (7%). We involved surgeons with advanced expertise in 9 percent (37 of 853) of cases. Surgical intervention was necessary in 29 of these cases, while the remaining 92 percent of operations were performed by the surgery hospitalists alone.

Time-to-consultation and ED provider satisfaction. The average time-to-consult from request to bedside evaluation averaged 16 minutes, and most patients (85%) were seen within five to 10 minutes. In a confidential survey of ED providers six months after the start of the program (response rate 76%, or 13 of 17), all providers believed that the surgical hospitalist program had improved timeliness of care, supervision of house staff, patient satisfaction, and professionalism of the surgical staff, and reduced ED length of stay (Figure 2, page 13). In addition, 84 percent believed the quality of care was either the same (38%) or better (46%). We also compared the wait time for patients undergoing appendectomy in a six-month period before and after the start of our program and found that it decreased 50 percent, from 16±10 hours to 8±4 hours ($P<.05$).

Revenue generation. Financial data from the division of finance of the UCSF department of surgery demonstrated a 190 percent increase in documented consults from the ED and inpatient wards in the first year of the program. This led to a 415 percent increase in year-over-year billable consult revenue. The greatest increase was observed in the area of subsequent care and follow-up, where a 24-fold increase in revenue was achieved through improved documentation and billing. Among patients treated, 51 percent were insured under capitated care plans, 44 percent had Medicare/Medicaid, and 4 percent were uninsured. Nonprocedural in-hospital care

accounted for 20 percent of the total revenue for the program. With the financial support of a hospital per diem rate for ED call coverage and the increased revenue (particularly from collections for improved documentation), the program was financially self-sustaining.

Enhanced efficiency and value of the surgical hospitalist program

Our preliminary findings suggest that the UCSF surgical hospitalist program is a new and effective way to provide safe and high-quality care in an era of fewer house staff hours, increasing patient volume and disease complexity, and increasing fragmentation of general surgery. Although other medical centers have combined emergency surgical care with trauma care or into “acute care surgery” programs in an effort to improve quality of care and reduce costs,¹¹⁻¹³ we believe our system of care is the first true surgical hospitalist model for general surgical care in the U.S. The primary focus of our program is on improving access and the processes of care for general surgical patients, with a lesser emphasis on trauma surgery, and without attempting to extend into the domains of neurosurgical or orthopaedic procedures. We propose this new model as an alternative to the acute care surgery programs being discussed nationally. Though the current model bears greatest relevance to academic teaching hospitals, there is the potential to use this as a foundation to improve the structure of emergency surgical care in every type of practice setting.

The hallmark is the availability and experience of dedicated on-site faculty who are continuously available for a weeklong period to enhance continuity of care, promote timely evaluation of consults, educate house staff and students, triage patients with complex surgical conditions, and implement patient safety measures. The success of the surgical hospitalist program is grounded in the following key principles:

- *Timeliness.* One of our most important findings was that the average waiting time for a patient to be seen by the surgical hospitalist service was 20 minutes. Often this would require that attending surgeons evaluate patients directly, before the house staff could see the

patients themselves. This increased timeliness of care improved relationships with other departments and the operating room, and served as the foundation of other hospital-based quality- and efficiency-improvement efforts.

- *Triage.* Some cases required specialized expertise—surgical hospitalists performed the initial stabilization and assessment, after which patient needs were matched to the appropriate expert among the remainder of the surgical faculty. The triage system provided a way for faculty to become more proficient in the care of patients with complex and challenging surgical diseases, with the assistance of senior-level experienced surgeons as necessary.

- *Documentation.* In an era of declining reimbursement, new strategies to address suboptimal reimbursement rates by maximizing nonoperative revenue are essential. Surgical hospitalists improved documentation for billing purposes, particularly of nonoperative care. Historically, surgeons have not focused on revenue generation from the delivery of care that does not result in an operation. In this study, 58 percent of consultations did not result in a procedure. One of the primary aims of the hospitalist program was to enhance collections from subsequent follow-up care, which had previously been poorly documented and billed. This eventually yielded approximately 20 percent of the overall revenue to support the service. Surgical hospitalist attendings also documented the initial consultation and daily progress notes, resulting in an overall 415 percent increase in revenue generation after the creation of the program.

- *Team-based group practice.* Surgical hospitalists freely transferred the care of inpatients from one to another at the end of the on-call week. This required a willingness to share in the care of patients and to adopt a team approach to perioperative care, which represents a major departure from the general surgical tradition of a solo practitioner. Our preliminary data suggest that perhaps the greatest beneficiaries of the surgical hospitalist model were the surgeons themselves. Under the new system, most general surgeons at our center were relieved of emergency call and could therefore focus on elective patient care, research, and teaching. Likewise, the three surgical hospitalists found their one

week of continuous call, free from elective clinics and procedures, preferable to the combination of a traditional 24-hour call schedule with an elective practice.

- *Resident supervision and strengthening the department of surgery's commitment to surgical education.* An important benefit of the new program was that it increased resident supervision on the wards and in the operating room and addressed the challenges in fragmentation and continuity of resident education after the introduction of the 80-hour workweek. Our impression was that house staff valued the real-time contact with faculty surgeons and the role modeling of timely and professional care, and 42 percent of house staff cited teaching as the greatest strength of the hospitalist service.

The generalizability of our pilot study is limited by its being retrospective and descriptive, as well as by its being the experience of a single tertiary academic medical center, where trauma represents a low percentage of patients and the patient population has a relatively favorable payor mix. Our experience highlights the benefits of the regionalization of trauma care to a site of expertise such as San Francisco General Hospital. To maximize patient safety, our program always required a surgeon to be available on back-up call, and it was expanded through 2007 by adding four surgeons.

Future directions

Generating institutional support for surgical hospitalists. A key task is to convince hospital leaders to support the new surgical hospitalist model of care by demonstrating value through savings and reduced health care costs. Current research explores the effect of surgical hospitalists on length of hospital stay and sets out to determine whether morbidity and mortality are reduced. Length of stay and costs may actually be greater if increasingly complex and ill patients are referred to UCSF from the community. Of importance will be to determine whether an increased value of the quality of care that is delivered offsets the costs to sustain the program.

Although our preliminary findings show that substantial resources can be generated by the hospitalist service, we need to determine the level

of external support appropriate to sustain the surgical hospitalist program. The medical hospitalist field has been nationally supported by medical centers that have recognized the value added by



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
the hospitalists and the need for institutional support to make up for shortfalls in clinical revenue generation that occur because of the time spent coordinating care, often for an unfavorable payor mix. In addition, medical centers will perhaps not realize the full benefits of surgical hospitalists until they deploy resources like weekend social workers or a dedicated emergency operating room suite.

Improving access through collaborations between surgical and medical hospitalists. Another key task is to develop collaborations between hospitalist programs in surgery and medicine to improve access to emergency care by maximizing hospital efficiencies and achieving hospital-based, patient safety initiatives. The track record of the UCSF medical hospitalist program provides the national visibility and foundation to develop strong and productive collaborations with an emphasis on error reduction, improved signouts, and evidence-based surgery. We intend to research ways that medical and surgical hospitalists can collaborate to alleviate ED overcrowding and boarding by accelerating the admission of ED patients, shortening ED waiting times, and facilitating inpatient discharges. We also intend to apply quality-improvement methods to reduce the morbidity and mortality of emergency surgical care delivered to high-risk patients admitted through the ED. We anticipate that greater coordination of perioperative processes of care will improve surgical outcomes and that increasing expertise in the delivery of care in an emergency setting can lead to improvements in the care of elective patients as well.

Enhancing patient safety and quality of surgical care nationally. Our long-term goal is to integrate existing surgical quality-improvement efforts nationally to enhance patient safety and the quality of surgical care. We view the surgical hospitalist program as a stepping-stone toward hospital-based patient-safety initiatives, such as perioperative wound infection prevention, deep venous thrombosis prophylaxis, and myocardial infarction prevention. An unanticipated benefit of our program was that the surgical hospitalists became recognized as institutional leaders in surgical quality-improvement projects, such as the Surgical Care Improvement Project. When onsite surgeons are dedicated to emergency care, they can

better understand and address problems with the institutional health care delivery system that need to be addressed through systems improvements and re-engineering. As has been observed with the medical hospitalists, perhaps today's surgical hospitalist will become the future hospital directors, chief medical officers, and chief quality officers.

Conclusions

Consistent with the intent of the American College of Surgeons' Statement on Emergency Surgical Care, the surgical hospitalist model seeks to advance the health of the public by addressing the crisis in access to emergency surgical care in America. The hospitalist model recognizes the evidence that on-site availability is critical to the provision of high-quality, cost-effective care, and that academic centers must provide professional, quality, and prompt care in the face of resident 80-hour workweek restrictions. Implementation of the surgical hospitalist model can improve the quality and efficiency of hospital-based surgical care and provide a foundation for surgical quality-improvement efforts to enhance the structure and processes of emergency surgical care in teaching hospitals. 

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